

Patent claims

1. A functional fluid comprising
- A) 1 to 99 % by weight based on the total weight of the functional fluid of alkyl(meth)acrylate polymers obtainable by polymerizing a mixture of olefinically unsaturated monomers, which consists of
 - a) 1-100 wt% based on the total weight of the ethylenically unsaturated monomers of one or more ethylenically unsaturated ester compounds of formula (I)



where R is hydrogen or methyl, R¹ means a linear or branched alkyl residue with 1-6 carbon atoms, R² and R³ independently represent hydrogen or a group of the formula –COOR', where R' means hydrogen or a alkyl group with 1-6 carbon atoms,

- b) 0-99 wt% based on the total weight of the ethylenically unsaturated monomers of one or more ethylenically unsaturated ester compounds of formula (II)



where R is hydrogen or methyl, R⁴ means a linear or branched alkyl residue with 7-40 carbon atoms, R⁵ and R⁶ independently are hydrogen or a group of the formula –COOR'', where R'' means hydrogen or an alkyl group with 7-40 carbon atoms,

- c) 0-50 wt% based on the total weight of the ethylenically unsaturated monomers comonomers,

and

- B) 1 to 99 % by weight based on the total weight of the functional fluid of an oxygen containing compound selected from the group of

carboxylic acid esters, polyether polyols and/or organophosphorus compounds.

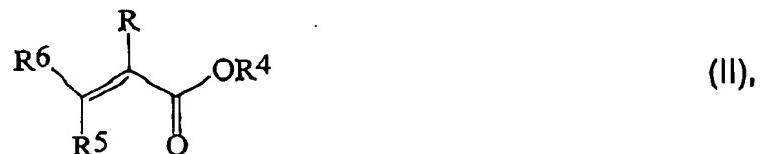
2. The functional fluid according to claim 1, wherein the oxygen containing compound has a fire point according to ASTM D 92 of at least 250 °C.
3. The functional fluid according to claim 1 or 2, wherein the oxygen containing compound has a kinematic viscosity at 40°C according to ASTM D 445 of 35 mm²/s or less.
4. The functional fluid according to one of the preceding claims, wherein the oxygen containing compound is a carboxylic ester containing at least two ester groups.
5. The functional fluid according to one of the preceding claims, wherein the oxygen containing compound is a diester of carboxylic acids containing 4 to 12 carbon atoms.
6. The functional fluid according to claim 5, wherein the the diester is a ester of adipic, azelaic, sebacic, phthalate and/or dodecanoic acids.
7. The functional fluid according to one of the preceding claims, wherein the oxygen containing compound is a ester of a polyol.
8. The functional fluid according to claim 7, wherein the polyol comprises 4 to 22 carbon atoms.
9. The functional fluid according to claim 8, wherein the ester is a ester of neopentyl glycol, diethylene glycol, dipropylene glycol, trimethanol propane, or pentaerythritol.

10. The functional fluid according to one of the preceding claims, wherein the oxygen containing compound is a polyalkylene glycol.
11. The functional fluid according to claim 10, wherein the polyether polyol is based on butylene oxide.
12. The functional fluid according to one of the preceding claims, wherein the alkyl(meth)acrylate polymers have a molecular weight in the range of 300 g/mol to 50 000 g/mol.
13. The functional fluid according to one of the preceding claims, wherein the alkyl(meth)acrylate polymers are obtainable by a mixture comprising
15-70 wt% of one or more ethylenically unsaturated ester compounds of formula (I)



where R is hydrogen or methyl, R¹ means a linear or branched alkyl residue with 1-6 carbon atoms, R² and R³ independently represent hydrogen or a group of the formula -COOR', where R' means hydrogen or a alkyl group with 1-6 carbon atoms.

14. The functional fluid according to one of the preceding claims, wherein the alkyl(meth)acrylate polymers are obtainable by a mixture comprising
30-85 wt% of one or more ethylenically unsaturated ester compounds of formula (II)



where R is hydrogen or methyl, R⁴ means a linear or branched alkyl residue with 7-40 carbon atoms, R⁵ and R⁶ independently are

hydrogen or a group of the formula -COOR", where R" means hydrogen or an alkyl group with 7-40 carbon atoms.

15. The functional fluid according to one of the preceding claims, wherein the alkyl(meth)acrylate polymers are obtainable by a mixture comprising dispersant monomers.
16. The functional fluid according to one of the preceding claims, wherein the alkyl(meth)acrylate polymers are obtainable by a mixture comprising vinyl monomers containing aromatic groups.
17. The functional fluid according to one of the preceding claims, wherein the weight ratio of the alkyl(meth)acrylate polymers to the oxygen containing compound is in the range of 2:1 to 1:10.
18. A hydraulic oil comprising the functional fluid according to one of the preceding claims.
19. The hydraulic oil according to claim 18, wherein the hydraulic oil comprises at least 20% by weight of the functional fluid according to one of the claims 1 to 17.
20. The use of a functional fluid according to one of the preceding claims to improve the fire resistance of hydraulic fluids, transformer oils and quench oils.
21. The use according to claim 20, wherein the hydraulic fluid is an anhydrous fluid.
22. A method for the manufacture of the functional fluid according to one of the claims 1 to 19, wherein a mixture of olefinically unsaturated monomers is polymerized in a fluid of an oxygen containing compound according to component B).